

SEQUENCE LISTING

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<120> mRNA Interferases and Methods of Use Thereof

<130> University of Medicine & Dentistry of New Jersey (601-1-131PCT)

<140> 10/560,303
<141> 2005-12-12

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<151> 2004-02-11

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<151> 2003-06-13

<160> 92

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aaaggtagcg agcaagctgg acatcgtcca gctgttgctc tgagtccttt catgtacaac 120
aacaaaacag gtatgtgtct gtgtgttcct tgtacaacgc aatcaaaagg atatccgttc 180
gaagttgttt tatccggta ggaacgtgat ggcgtagcgt tagctgatca ggtaaaaagt 240
atcgccctggc gggcaagagg agcaacgaag aaaggaacag ttgccccaga ggaattacaa 300
ctcattaaag ccaaaattaa cgtactgatt gggtag 336

<210> 2
<211> 111
<212> PRT
<213> E. coli

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Met Val Ser Arg Tyr Val Pro Asp Met Gly Asp Leu Ile Trp Val Asp
1 5 10 15
Phe Asp Pro Thr Lys Gly Ser Glu Gln Ala Gly His Arg Pro Ala Val
20 25 30
Val Leu Ser Pro Phe Met Tyr Asn Asn Lys Thr Gly Met Cys Leu Cys
35 40 45
Val Pro Cys Thr Thr Gln Ser Lys Gly Tyr Pro Phe Glu Val Val Leu
50 55 60
Ser Gly Gln Glu Arg Asp Gly Val Ala Leu Ala Asp Gln Val Lys Ser
65 70 75 80
Ile Ala Trp Arg Ala Arg Gly Ala Thr Lys Lys Gly Thr Val Ala Pro
85 90 95
Glu Glu Leu Gln Leu Ile Lys Ala Lys Ile Asn Val Leu Ile Gly
100 105 110

<210> 3
 <211> 333
 <212> DNA
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<400> 3
 atggaaagag gggaaatctg gcttgtctcg cttgattccta ccgcagggtca tgagcagcag 60
 ggaacgcggc cgggtgctgat tgtcacaccg gcggccttta atcgcgtgac ccgcctgcct 120
 gttgttgtgc ccgtaaccag cggaggcaat tttgcccgca ctgccggctt tgcgggtgtcg 180
 ttggatgggtg ttggcatatc taccacaggt gttgtacgtt gcgatcaacc ccggacaatt 240
 gatattgaaag cacggggcgg aaaacgactc gaacgggttc cggagactat catgaacgaa 300
 gttcttggcc gcctgtccac tattctgact tga 333

<210> 4
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 <212> PRT
 <213> E. coli

<400> 4
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 His Glu Gln Gln Gly Thr Arg Pro Val Leu Ile Val Thr Pro Ala Ala
 20 25 30
 Phe Asn Arg Val Thr Arg Leu Pro Val Val Val Pro Val Thr Ser Gly
 35 40 45
 Gly Asn Phe Ala Arg Thr Ala Gly Phe Ala Val Ser Leu Asp Gly Val
 50 55 60
 Gly Ile Arg Thr Thr Gly Val Val Arg Cys Asp Gln Pro Arg Thr Ile
 65 70 75 80
 Asp Met Lys Ala Arg Gly Gly Lys Arg Leu Glu Arg Val Pro Glu Thr
 85 90 95
 Ile Met Asn Glu Val Leu Gly Arg Leu Ser Thr Ile Leu Thr
 100 105 110

<210> 5
 <211> 249
 <212> DNA
 <213> E. coli

<400> 5
 atgatccaca gtagcgtaaa gcgttgggga aattcaccgg cgggtgcggat cccgggtacg 60
 ttaatgcagg cgctcaatct gaattattgat gatgaagtga agattgacct ggtggatggc 120
 aaattaatta ttgagccagt gcgtaaagag cccgtattta cgcttgctga actggtcaac 180
 gacatcacgc cggaaaacct ccacgagaat atcgactggg gagagccgaa agataaggaa 240
 gtctggttaa 249

<210> 6
 <211> 82
 <212> PRT
 <213> E. coli

<400> 6
 Met Ile His Ser Ser Val Lys Arg Trp Gly Asn Ser Pro Ala Val Arg
 1 5 10 15
 Ile Pro Ala Thr Leu Met Gln Ala Leu Asn Leu Asn Ile Asp Asp Glu
 20 25 30

Val Lys Ile Asp Leu Val Asp Gly Lys Leu Ile Ile Glu Pro Val Arg
 35 40 45
 Lys Glu Pro Val Phe Thr Leu Ala Glu Leu Val Asn Asp Ile Thr Pro
 50 55 60
 Glu Asn Leu His Glu Asn Ile Asp Trp Gly Glu Pro Lys Asp Lys Glu
 65 70 75 80
 Val Trp

<210> 7
 <211> 258
 <212> DNA
 <213> E. coli

<400> 7
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 ctgctgaatg cgctgtctct gggcacagat aatgaagttg gcatgggtcat tgataatggc 120
 cggctgattg ttgagccgta cagacgcccg caatattcac tggctgagct actggcacag 180
 tgtgatccga atgctgaaat atcagctgaa gaacgagaat ggctggatgc accggcgact 240
 ggtcaggagg aaatctga 258

<210> 8
 <211> 85
 <212> PRT
 <213> E. coli

<400> 8
 Met His Thr Thr Arg Leu Lys Arg Val Gly Gly Ser Val Met Leu Thr
 1 5 10 15
 Val Pro Pro Ala Leu Leu Asn Ala Leu Ser Leu Gly Thr Asp Asn Glu
 20 25 30
 Val Gly Met Val Ile Asp Asn Gly Arg Leu Ile Val Glu Pro Tyr Arg
 35 40 45
 Arg Pro Gln Tyr Ser Leu Ala Glu Leu Leu Ala Gln Cys Asp Pro Asn
 50 55 60
 Ala Glu Ile Ser Ala Glu Glu Arg Glu Trp Leu Asp Ala Pro Ala Thr
 65 70 75 80
 Gly Gln Glu Glu Ile
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<210> 9
 <211> 24
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> T54 to K77 fragment of E. coli Maze

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 Thr Leu Ala Glu Leu Val Asn Asp Ile Thr Pro Glu Asn Leu His Glu
 1 5 10 15
 Asn Ile Asp Trp Gly Glu Pro Lys
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<210> 10
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> N60 to K77 fragment of E. coli Maze

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 Asn Asp Ile Thr Pro Glu Asn Leu His Glu Asn Ile Asp Trp Gly Glu
 1 5 10 15
 Pro Lys

<210> 11
 <211> 30
 <212> RNA
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<220>
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<400> 11
 uaagaaggag auauacauau gaaucaaauc 30

<210> 12
 <211> 50
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> single stranded oligonucleotide

<400> 12
 gctcgatctt acaatgtaga ttgatata ctgtatctac atatgatagc 50

<210> 13
 <211> 50
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> single stranded oligonucleotide

<400> 13
 cgagcataga tggtacatct aactatatat gacatagatg tatactatcg 50

<210> 14
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic oligonucleotide

<400> 14
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<210> 15
 <211> 27
 <212> DNA
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<220>
 <223> DNA primer

<400> 15 ttagagatca atttcctgcc gttttac	27
<210> 16 <211> 22 <212> DNA <213> Artificial Sequence	
<220> <223> DNA primer	
<400> 16 ttaaagatcg tcaacgtaac cg	22
<210> 17 <211> 22 <212> DNA <213> Artificial Sequence	
<220> <223> DNA primer	
<400> 17 tgctctttat cccacgggca gc	22
<210> 18 <211> 24 <212> DNA <213> Artificial Sequence	
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<400> 18 gcccagttca ccgcaagat cgtc	24
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<400> 19 ggttttgatt tgctcccaac gggcaag	27
<210> 20 <211> 27 <212> DNA <213> Artificial Sequence	
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<400> 20 catttcctcc tccagtttag cctggtc	27
<210> 21 <211> 27 <212> DNA <213> Artificial Sequence	

<220>
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 <400> 21
 ttgccagact tcttcattg tttcgag 27

 <210> 22
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 <212> DNA
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 <220>
 <223> DNA primer

 <400> 22
 gatccccaca atgcggtgac gagt 24

 <210> 23
 <211> 24
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 <220>
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 <400> 23
 cacgttgccc actttgttca ccgc 24

 <210> 24
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> DNA primer

 <400> 24
 cagttcagcg ccgaggaaac gcat 24

 <210> 25
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> DNA primer

 <400> 25
 gcgttcgtcg tcggcccaac cgga 24

 <210> 26
 <211> 30
 <212> RNA
 <213> Artificial Sequence

 <220>
 <223> antisense RNA

 <400> 26
 gaaugauuc auauguauau cuccuucua 30

 <210> 27
 <211> 30
 <212> DNA

<213> Artificial Sequence
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 <223> complementary DNA
 <400> 27
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 <212> DNA
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 <223> DNA primer
 <400> 28
 agaatgtgcg ccatttttca ct 22
 <210> 29
 <211> 9
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> DNA fragment
 <400> 29
 taatacacc 9
 <210> 30
 <211> 15
 <212> DNA
 <213> Artificial Sequence
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 <223> synthetic oligonucleotide
 <400> 30
 atgaatcaca aagtg 15
 <210> 31
 <211> 18
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> DNA fragment
 <400> 31
 catcatcatc atcatcat 18
 <210> 32
 <211> 12
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> DNA fragment
 <400> 32
 atcgaaggta gg 12
 <210> 33

<211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> multiple cloning site

 <400> 33
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<210> 34
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> DNA primer

 <400> 34
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21

<210> 35
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA primer

<400> 35
 ctcaatgatc acaggagata c

21

<210> 36
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA primer

<400> 36
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21

<210> 37
 <211> 16
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA primer

<400> 37
 gggacaggag atacct

16

<210> 38
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA primer

<400> 38
tgtcctctat ggagttacta gtg

23

<210> 39
<211> 330
<212> DNA
<213> *Bacillus halodurans*

<400> 39
atgccagttac cggatagagg gaatcttggt tatgtagact ttaaccacaca atcgggtcat 60
gaccaagccg ggacacgacc ggctattggt ttgtccccta aattatttaa taaaaacaca 120
ggttttgcgg tggtttggtcc aattaccaga caacaaaaag gttatccttt tgaaatagaa 180
ataccaccgg gggtacctat tgaaggggtt attcttactg accaagtaaa aagtctggat 240
tggagagcaa gaaactttca cattaaagga caagcaccag aggaaactgt tactgattgt 300
ttacaactta ttcatacatt tttatcctaa 330

<210> 40
<211> 363
<212> DNA
<213> *Staphylococcus epidermidis*

<400> 40
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gggggagtaa gacctgtagt tatcattcaa aatgatactg gtaataaata tagtccaact 120
gtaattgtag ctgcgattac tgatgggatt aataaagcga aaataccaac ccacgtagaa 180
attgaaaaga aaaagtataa attagacaaa gattcagtta ttcttcttga acaaattaga 240
acactagata aaaagcgttt aaaagaaaaa ttaacatttt tatcagagag taaaatgata 300
gaggttgata atgcccttaga tattagtttg ggattaaata actttgatca tcataaatct 360
taa 363

<210> 41
<211> 411
<212> DNA
<213> *Staphylococcus aureus*

<400> 41
atgattagac gaggagatgt ttatttagca gatttatcac cagtacaggg atctgaacaa 60
gggggagta gacctgtagt cataattcaa aatgatactg gtaataaata tagtcctaca 120
gttattgttg cggcaataac tggtaggatt aataaagcga aaataccgac acatgtagag 180
attgaaaaga aaaagtataa gttggataaa gactcagtta tattattaga acaaattcgt 240
acacttgata aaaaacgatt gaaagaaaaa ctgacgtact tatccgatga taaaatgaaa 300
gaagtagata atgcactaat gattagttta gggctgaatg cagtagctca accagaaaaa 360
ttaggcgtct attatatgta tttttcagag ataaataaaa tattgatata a 411

<210> 42
<211> 351
<212> DNA
<213> *Bacillus subtilis*

<400> 42
ttgattgtga aacgcggcga tgtttatfff gctgatttat ctctgttgtg tggctcagag 60
caaggcgggg tgcgcccggg tttagtgatc caaatgaca tcggaaatcg cticagccca 120
actgctattg ttgcagccat aacagcacia atacagaaag cgaaattacc aaccacgctc 180
gaaatcgatg caaaacgcta cggttttgaa agagattccg ttattttgct ggagcaaatt 240
cggacgattg acaagcaaaag gttaacggat aagattactc atctggatga tgaaatgatg 300
gataaggttg atgaagcctt acaaatcagt ttggcactca ttgattttta g 351

<210> 43
<211> 324
<212> DNA
<213> *Neisseria meningitides*

<400> 43

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gaaatcaaaa agacacgtcc ttgtgtcgta gtctctcctc ctgaaatata caactatctc 120
aagactgtgc tgatcggtcc catgacgagc ggaagccgtc ctgccccgtt ccgcgtcaat 180
gtccgctttc aggataaaga cggtttgctt ttgcccgaac agattagggc tgtggataaa 240
gccggattgg tcaaacatct tggcaattta gacaacagta cggctgaaaa actgtttgca 300
gtattgcagg agatgtttgc ctga

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<210> 44

<211> 366

<212> DNA

<213> *Morganella morganii*

<400> 44

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atgcgccggc ggctgggtcag gaggaatct gacatggaaa gaggggaaat ctggcttgtc 60
tcgcttgacc ctaccgcagg tcatgagcag cagggaacgc ggccgggtact gattgtcacg 120
ccggctgctt ttaaccgcgt gacccgcctg cctgttggtg tgcccgtgac cagcggaggt 180
aatittgccc gcacagcagg ctttgcgtgt tcgcttgacg gcgccggcat acgtaccacc 240
ggcgttggtc gttgcgatca accccggacg atcgatatga aagcccgcgg cggcaaacga 300
ctcgaacggg tgccagagac tatcatggac gacgttcttg gccgtctggc caccatcctg 360
acctga

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<210> 45

<211> 321

<212> DNA

<213> *Mycobacterium tuberculosis*

<400> 45

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gtggtgattc ggggagcggg ctacaggggc gacttcggcg atgcgaagcg aggccacgag 60
caacgcgggc ggcgctacgc cgtggtcatc agccccggct cgatgccgtg gagtgtagta 120
accgtggtgc cgacgtcgac aagcgcccaa cctgcgggtt tccgaccaga gctggaagtc 180
atgggaacaa agacacgggt cctgggtgat cagatccgga cgatcggcat cgtctatgtg 240
cacggcgatc cggtcgacta tctggaccgt gaccaaattg ccaaggtgga acacgccgtg 300
gcacgatacc ttggtctgtg a

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<210> 46

<211> 109

<212> PRT

<213> *Bacillus halodurans*

<400> 46

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Gln Ser Gly His Asp Gln Ala Gly Thr Arg Pro Ala Ile Val Leu Ser
20     25     30
Pro Lys Leu Phe Asn Lys Asn Thr Gly Phe Ala Val Val Cys Pro Ile
35     40     45
Thr Arg Gln Gln Lys Gly Tyr Pro Phe Glu Ile Glu Ile Pro Pro Gly
50     55     60
Leu Pro Ile Glu Gly Val Ile Leu Thr Asp Gln Val Lys Ser Leu Asp
65     70     75     80
Trp Arg Ala Arg Asn Phe His Ile Lys Gly Gln Ala Pro Glu Glu Thr
85     90     95
Val Thr Asp Cys Leu Gln Leu Ile His Thr Phe Leu Ser
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<210> 47

<211> 120

<212> PRT

<213> *Staphylococcus epidermidis*

<400> 47

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Met Ile Arg Arg Gly Asp Val Tyr Leu Ala Asp Leu Ser Pro Val Gln
1      5      10      15

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Gly Ser Glu Gln Gly Gly Val Arg Pro Val Val Ile Ile Gln Asn Asp
 20 25 30
 Thr Gly Asn Lys Tyr Ser Pro Thr Val Ile Val Ala Ala Ile Thr Asp
 35 40 45
 Gly Ile Asn Lys Ala Lys Ile Pro Thr His Val Glu Ile Glu Lys Lys
 50 55 60
 Lys Tyr Lys Leu Asp Lys Asp Ser Val Ile Leu Leu Glu Gln Ile Arg
 65 70 75
 Thr Leu Asp Lys Lys Arg Leu Lys Glu Lys Leu Thr Phe Leu Ser Glu
 85 90 95
 Ser Lys Met Ile Glu Val Asp Asn Ala Leu Asp Ile Ser Leu Gly Leu
 100 105 110
 Asn Asn Phe Asp His His Lys Ser
 115 120

<210> 48
 <211> 136
 <212> PRT
 <213> Staphylococcus aureus

<400> 48
 Met Ile Arg Arg Gly Asp Val Tyr Leu Ala Asp Leu Ser Pro Val Gln
 1 5 10 15
 Gly Ser Glu Gln Gly Gly Val Arg Pro Val Val Ile Ile Gln Asn Asp
 20 25 30
 Thr Gly Asn Lys Tyr Ser Pro Thr Val Ile Val Ala Ala Ile Thr Gly
 35 40 45
 Arg Ile Asn Lys Ala Lys Ile Pro Thr His Val Glu Ile Glu Lys Lys
 50 55 60
 Lys Tyr Lys Leu Asp Lys Asp Ser Val Ile Leu Leu Glu Gln Ile Arg
 65 70 75
 Thr Leu Asp Lys Lys Arg Leu Lys Glu Lys Leu Thr Tyr Leu Ser Asp
 85 90 95
 Asp Lys Met Lys Glu Val Asp Asn Ala Leu Met Ile Ser Leu Gly Leu
 100 105 110
 Asn Ala Val Ala Gln Pro Glu Lys Leu Gly Val Tyr Tyr Met Tyr Phe
 115 120 125
 Ser Glu Ile Asn Lys Ile Leu Ile
 130 135

<210> 49
 <211> 116
 <212> PRT
 <213> Bacillus subtilis

<400> 49
 Met Ile Val Lys Arg Gly Asp Val Tyr Phe Ala Asp Leu Ser Pro Val
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 Val Gly Ser Glu Gln Gly Gly Val Arg Pro Val Leu Val Ile Gln Asn
 20 25 30
 Asp Ile Gly Asn Arg Phe Ser Pro Thr Ala Ile Val Ala Ala Ile Thr
 35 40 45
 Ala Gln Ile Gln Lys Ala Lys Leu Pro Thr His Val Glu Ile Asp Ala
 50 55 60
 Lys Arg Tyr Gly Phe Glu Arg Asp Ser Val Ile Leu Leu Glu Gln Ile
 65 70 75 80
 Arg Thr Ile Asp Lys Gln Arg Leu Thr Asp Lys Ile Thr His Leu Asp
 85 90 95
 Asp Glu Met Met Asp Lys Val Asp Glu Ala Leu Gln Ile Ser Leu Ala
 100 105 110
 Leu Ile Asp Phe
 115

<210> 50
 <211> 115
 <212> PRT
 <213> Neisseria meningitides

<400> 50
 Met Tyr Ile Pro Asp Lys Gly Asp Ile Phe His Leu Asn Phe Asp Pro
 1 5 10 15
 Ser Ser Gly Lys Glu Ile Lys Gly Gly Arg Phe Ala Leu Ala Leu Ser
 20 25 30
 Pro Lys Ala Phe Asn Arg Ala Thr Gly Leu Val Phe Ala Cys Pro Ile
 35 40 45
 Ser Gln Gly Asn Ala Ala Ala Arg Ser Ser Gly Met Ile Ser Thr
 50 55 60
 Leu Leu Gly Ala Gly Thr Glu Thr Gln Gly Asn Val His Cys His Gln
 65 70 75 80
 Leu Lys Ser Leu Asp Trp Gln Ile Arg Lys Ala Ser Phe Lys Glu Thr
 85 90 95
 Val Pro Asp Tyr Val Leu Asp Asp Val Leu Ala Arg Ile Gly Ala Val
 100 105 110
 Leu Phe Asp
 115

<210> 51
 <211> 121
 <212> PRT
 <213> Morganella morganii

<400> 51
 Met Arg Arg Arg Leu Val Arg Arg Lys Ser Asp Met Glu Arg Gly Glu
 1 5 10 15
 Ile Trp Leu Val Ser Leu Asp Pro Thr Ala Gly His Glu Gln Gln Gly
 20 25 30
 Thr Arg Pro Val Leu Ile Val Thr Pro Ala Ala Phe Asn Arg Val Thr
 35 40 45
 Arg Leu Pro Val Val Val Pro Val Thr Ser Gly Gly Asn Phe Ala Arg
 50 55 60
 Thr Ala Gly Phe Ala Val Ser Leu Asp Gly Ala Gly Ile Arg Thr Thr
 65 70 75 80
 Gly Val Val Arg Cys Asp Gln Pro Arg Thr Ile Asp Met Lys Ala Arg
 85 90 95
 Gly Gly Lys Arg Leu Glu Arg Val Pro Glu Thr Ile Met Asp Asp Val
 100 105 110
 Leu Gly Arg Leu Ala Thr Ile Leu Thr
 115 120

<210> 52
 <211> 118
 <212> PRT
 <213> Mycobacterium tuberculosis

<400> 52
 Met Met Arg Arg Gly Glu Ile Trp Gln Val Asp Leu Asp Pro Ala Arg
 1 5 10 15

Gly	Ser	Glu	Ala	Asn	Asn	Gln	Arg	Pro	Ala	Val	Val	Val	Ser	Asn	Asp
			20					25					30		
Arg	Ala	Asn	Ala	Thr	Ala	Thr	Arg	Leu	Gly	Arg	Gly	Val	Ile	Thr	Val
		35					40					45			
Val	Pro	Val	Thr	Ser	Asn	Ile	Ala	Lys	Val	Tyr	Pro	Phe	Gln	Val	Leu
	50				55						60				
Leu	Ser	Ala	Thr	Thr	Thr	Gly	Leu	Gln	Val	Asp	Cys	Lys	Ala	Gln	Ala
65					70					75				80	
Glu	Gln	Ile	Arg	Ser	Ile	Ala	Thr	Glu	Arg	Leu	Leu	Arg	Pro	Ile	Gly
			85					90						95	
Arg	Val	Ser	Ala	Ala	Glu	Leu	Ala	Gln	Leu	Asp	Glu	Ala	Leu	Lys	Leu
			100					105					110		
His	Leu	Asp	Leu	Trp	Ser										
		115													

<210> 53
 <211> 243
 <212> DNA
 <213> *Deinococcus radiodurans*

<400> 53
 atgacgagtc aaattcagaa atggggcaac agcctcgcgc tccgcattcc caaagctctg 60
 gcgcagcagg tgggactgac gcagagttca gaagtggagc tgcttcttca ggacggtcag 120
 attgtcatcc ggccagttcc tgctcggcag tacgatctcg ccgcgctgct ggccgaaatg 180
 acacctgaaa atctgcatgg ggaaacagac tggggcgcac tggaaggacg cgaggaatgg 240
 taa 243

<210> 54
 <211> 246
 <212> DNA
 <213> *Bacillus halodurans*

<400> 54
 gtgacactca tgactactat acaaaaagtg ggaaatagtt tagctgttcg tattccgaac 60
 cattatgcta aacatattaa cgttacgcaa ggatctgaaa ttgaactaag cttagggagt 120
 gatcaaacga ttatttttaa gcctaaaaaa agaaagccaa cattagagga attagtggca 180
 aaaatcactc ctgaaaacag acataacgaa attgatttcg ggagaacagg aaaggaattg 240
 ttgtaa 246

<210> 55
 <211> 258
 <212> DNA
 <213> *E. coli* Plasmid R100

<400> 55
 atgcatacca cccgactgaa gaggggttggc ggctcagtta tgctgaccgt cccaccggca 60
 ctgctgaatg cgctgtctct gggcacagat aatgaagtgt gcatgggtcat tgataatggc 120
 cggctgattg ttgagccgta cagacgcccg caatattcac tggctgagct actggcacag 180
 tgtgatccga atgctgaaat atcagctgaa gaacgagaat ggctggatgc accggcgact 240
 ggtcaggagg aaatctga 248

<210> 56
 <211> 294
 <212> DNA
 <213> *E. coli* Plasmid R466b

<400> 56

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atgttatatt taaatataac ttttatggag ggaaaaaatgc ataccactcg actgaagaag 60
gttggcggct cagtcattgct gaccgtccca ccggcactgc tgaatgcgct gtcgctgggt 120
acagataatg aagttggcat ggtcattgat aatggccggc tgattgtgga gccgcacaga 180
cgcccgcagt attcactggc tgagctgttg gcacagtgcg atccgaacgc tgaaatctcg 240
gcagaagaac gtgaatggct ggatgcgccg gcggctggtc aggaggaaat ctga 294

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<210> 57

<211> 258

<212> DNA

<213> Escherichia coli

<400> 57

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gtgcagatgc gtattaccat aaaaagatgg gggaacagtg caggatatggt cattcccaat 60
atcgtaatga aagaacttaa cttacagccg gggcagagcg tggaaagtga ggtgagcaac 120
aaccaactga ttctgacacc catctccagg cgctactcgc ttgatgaact gctggcacag 180
tgtgacatga acgccgcgga acttagcgag caggatgtct ggggtaaatc caccctgcg 240
ggtgacgaaa tatggtaa 258

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<210> 58

<211> 255

<212> DNA

<213> Pseudomonas putida

<400> 58

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atgcagatca agattcaaca gtggggcaac agcgccgcga tccgcttgcc cgccgcagta 60
ctcaagcaga tgcgcctcgg tctcggctcc accctgagcc ttgacacaac gggtgagacg 120
atggtgctca aaccgcgcag gtcgaaaccc aagtacacc ttgaggaact gatggcccag 180
tgtgacctga gtgcaccgga gccagaggac atggccgact ggaatgccat gcgccagtg 240
gggcgtgaag tgtga 255

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<210> 59

<211> 260

<212> DNA

<213> Photobacterium profundum

<400> 59

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gtgcaatgag aactcagata agaaagatcg gtaactcact tggttcaatt attcctgcca 60
cttttattcg tcagcttgaa ctggcagagg gcgcagaaat tgatgttaaa acggttgatg 120
gaaaaattgt gattgagcca attagaaaaa tgaaaaaacg tttccattc agtgagcgtg 180
aattactaag tggattggat gcacacactg ctcatgctga cgaactggtt gtaatttcta 240
cccaggagct aggcgaataa 260

```

<210> 60

<211> 80

<212> PRT

<213> Deinococcus radiodurans

<400> 60

```

Met Thr Ser Gln Ile Gln Lys Trp Gly Asn Ser Leu Ala Leu Arg Ile
1      5      10      15
Pro Lys Ala Leu Ala Gln Gln Val Gly Leu Thr Gln Ser Ser Glu Val
20     25     30
Glu Leu Leu Leu Gln Asp Gly Gln Ile Val Ile Arg Pro Val Pro Ala
35     40     45
Arg Gln Tyr Asp Leu Ala Ala Leu Leu Ala Glu Met Thr Pro Glu Asn
50     55     60
Leu His Gly Glu Thr Asp Trp Gly Ala Leu Gly Arg Glu Glu Trp
65     70     75     80

```

<210> 61
 <211> 81
 <212> PRT
 <213> Bacillus halodurans

<400> 61
 Met Thr Leu Met Thr Thr Ile Gln Lys Trp Gly Asn Ser Leu Ala Val
 1 5 10 15
 Arg Ile Pro Asn His Tyr Ala Lys His Ile Asn Val Thr Gln Gly Ser
 20 25 30
 Glu Ile Glu Leu Ser Leu Gly Ser Asp Gln Thr Ile Ile Leu Lys Pro
 35 40 45
 Lys Lys Arg Lys Pro Thr Leu Glu Glu Leu Val Ala Lys Ile Thr Pro
 50 55 60
 Glu Asn Arg His Asn Glu Ile Asp Phe Gly Arg Thr Gly Lys Glu Leu
 65 70 75 80
 Leu

<210> 62
 <211> 85
 <212> PRT
 <213> E. coli PemI plasmid R100

<400> 62
 Met His Thr Thr Arg Leu Lys Arg Val Gly Gly Ser Val Met Leu Thr
 1 5 10 15
 Val Pro Pro Ala Leu Leu Asn Ala Leu Ser Leu Gly Thr Asp Asn Glu
 20 25 30
 Val Gly Met Val Ile Asp Asn Gly Arg Leu Ile Val Glu Pro Tyr Arg
 35 40 45
 Arg Pro Gln Tyr Ser Leu Ala Glu Leu Leu Ala Gln Cys Asp Pro Asn
 50 55 60
 Ala Glu Ile Ser Ala Glu Glu Arg Glu Trp Leu Asp Ala Pro Ala Thr
 65 70 75 80
 Gly Gln Glu Glu Ile
 85

<210> 63
 <211> 97
 <212> PRT
 <213> E. coli PemI plasmid R466b

<400> 63
 Met Leu Tyr Leu Asn Ile Thr Phe Met Glu Gly Lys Met His Thr Thr
 1 5 10 15
 Arg Leu Lys Lys Val Gly Gly Ser Val Met Leu Thr Val Pro Pro Ala
 20 25 30
 Leu Leu Asn Ala Leu Ser Leu Gly Thr Asp Asn Glu Val Gly Met Val
 35 40 45
 Ile Asp Asn Gly Arg Leu Ile Val Glu Pro His Arg Arg Pro Gln Tyr
 50 55 60
 Ser Leu Ala Glu Leu Leu Ala Gln Cys Asp Pro Asn Ala Glu Ile Ser
 65 70 75 80
 Ala Glu Glu Arg Glu Trp Leu Asp Ala Pro Ala Ala Gly Gln Glu Glu
 85 90 95
 Ile

<210> 64

<211> 85
 <212> PRT
 <213> Escherichia coli

<400> 64
 Met Gln Met Arg Ile Thr Ile Lys Arg Trp Gly Asn Ser Ala Gly Met
 1 5 10 15
 Val Ile Pro Asn Ile Val Met Lys Glu Leu Asn Leu Gln Pro Gly Gln
 20 25 30
 Ser Val Glu Ala Gln Val Ser Asn Gln Leu Ile Leu Thr Pro Ile
 35 40 45
 Ser Arg Arg Tyr Ser Leu Asp Glu Leu Leu Ala Gln Cys Asp Met Asn
 50 55 60
 Ala Ala Glu Leu Ser Glu Gln Asp Val Trp Gly Lys Ser Thr Pro Ala
 65 70 75 80
 Gly Asp Glu Ile Trp
 85

<210> 65
 <211> 84
 <212> PRT
 <213> Pseudomonas putida

<400> 65
 Met Gln Ile Lys Ile Gln Gln Trp Gly Asn Ser Ala Ala Ile Arg Leu
 1 5 10 15
 Pro Ala Ala Val Leu Lys Gln Met Arg Leu Gly Val Gly Ser Thr Leu
 20 25 30
 Ser Leu Asp Thr Thr Gly Glu Thr Met Val Leu Lys Pro Val Arg Ser
 35 40 45
 Lys Pro Lys Tyr Thr Leu Glu Glu Leu Met Ala Gln Cys Asp Leu Ser
 50 55 60
 Ala Pro Glu Pro Glu Asp Met Ala Asp Trp Asn Ala Met Arg Pro Val
 65 70 75 80
 Gly Arg Glu Val

<210> 66
 <211> 85
 <212> PRT
 <213> Photobacterium profundum

<400> 66
 Ala Met Arg Thr Gln Ile Arg Lys Ile Gly Asn Ser Leu Gly Ser Ile
 1 5 10 15
 Ile Pro Ala Thr Phe Ile Arg Gln Leu Glu Leu Ala Glu Gly Ala Glu
 20 25 30
 Ile Asp Val Lys Thr Val Asp Gly Lys Ile Val Ile Glu Pro Ile Arg
 35 40 45
 Lys Met Lys Lys Arg Phe Pro Phe Ser Glu Arg Glu Leu Leu Ser Gly
 50 55 60
 Leu Asp Ala His Thr Ala His Ala Asp Glu Leu Val Val Ile Ser Thr
 65 70 75 80
 Gln Glu Leu Gly Glu
 85

<210> 67
 <211> 228
 <212> DNA
 <213> Homo sapiens

>
 <400> 67
 atgggtccag catctgttcc gactacctgt tgctttaacc tggcgaaccg caaaattccg 60
 ctgcagcgcc tggaaaagcta tcgccgtatt acctctggca aatgcccgcg gaaagcggcg 120
 atctttaaaa ccaaactggc gaaagatatt tgcgcggatc cgaaaaaaa atgggtgcag 180
 gattctatga aatatctgga tcagaaatct ccgaccccga aaccgtaa 228

<210> 68
 <211> 73
 <212> PRT
 <213> Homo sapiens

<400> 68
 Gly Pro Ala Ser Pro Thr Thr Cys Cys Phe Asn Leu Ala Asn Arg Lys
 1 5 10 15
 Ile Pro Leu Gln Arg Leu Glu Ser Tyr Arg Arg Ile Thr Ser Gly Lys
 20 25 30
 Cys Pro Gln Lys Ala Val Ile Phe Lys Thr Lys Leu Ala Lys Asp Ile
 35 40 45
 Cys Ala Asp Pro Lys Lys Lys Trp Val Gln Asp Ser Met Lys Tyr Leu
 50 55 60
 Asp Gln Lys Ser Pro Thr Pro Lys Pro
 65 70

<210> 69
 <211> 357
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 69
 gtgatgcgcc gcggtgagat ttggcaggct gatctcgacc ccgctcgagg tagcgaagcg 60
 aacaaccagc gccccgcgct cgctcgtcagc aacgaccggg ccaacgcgac cgccacgcgt 120
 cttggggcgc gcgtcatcac cgctcgtgccg gtgacgagca acatcgccaa ggtctatccg 180
 tttcagggtg ttgtgtcggc caccactact ggtctccagg tcgactgcaa ggcgcaggcc 240
 gagcaaatca gatcgattgc taccgagcgg ttgctccggc caatcggccg agtttcagcc 300
 gccgaacttg cccagctcga tgaggctttg aaactgcatc tcgacttatg gtcgtag 357

<210> 70
 <211> 282
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 70
 atgctgcgcg gtgagatctg gcaggctcgac ctggatccgg cccgcggcag cgcgggcaa 60
 atgcggcggc cagcggtaat tgtcagcaac gacagggcca acgctgccgc gatacgtctc 120
 gaccgaggcg tgggtgccgt tgtcccgggt accagcaaca ccgaaaaggc cccattcca 180
 ggtgtgtgtg ccggcagcga gcggtggcct ggccgtcgat tcgaaggcgc aggcccagca 240
 ggttgatcc gtcgctgcgc aacgtctccc ctgccgagct ga 282

<210> 71
 <211> 345
 <212> DNA
 <213> Mycobacterium tuberculosis

<400> 71
 gtggtgatta gtcgtgccga gatctactgg gctgacctcg ggccgccatc aggcagtcag 60
 ccggcgaaag gccgcccggg gctcgtaatc cagtcagatc cgtacaacgc aagtcgcctt 120
 gccactgtga tcgcagcggg gatcacgtcc aatacggcgc tggcggcaat gcccggaac 180
 gtgttcttgc ccgcgaccac aacgcgactg ccacgtgact cggtcgtcaa cgtcacggcg 240

attg²acgc tcaacaagac tgacctcacc gaccgagttg gggagggtgcc agcgagcttg 300
atgcacgagg ttgaccgagg acttcgtcgc gtactggacc ttga 345

<210> 72

<211> 309

<212> DNA

<213> Mycobacterium tuberculosis

<400> 72

atgcggcgcg gtgaattgtg gtttgccgcc acacctgggtg gtgacagacc agtacttgtc 60
cttaccagag atccgggtggc agaccgcacg ggcgcgggtcg ttgtgggtggc cctaaccgcg 120
acccgccgag gcctgggtgtc ggaattggag ctacacggccg tcgaaaaccg tggtccgagc 180
gactgctgcg tcaacttcga caacattcat acgttgccac gcaccgcatt ccgacgccgc 240
atcaccggcg tgtccccggc ccgcctgcac gaagcctgtc aaacactccg ggcgagcacg 300
gggtgttga 309

<210> 73

<211> 330

<212> DNA

<213> Mycobacterium tuberculosis

<400> 73

gtgaccgcac ttccggcgcg cggagaggtg tgggtggtgtg agatggctga gatcggtcgg 60
cgaccagtgc tcgtgctgtc gcgcgatgcc gcgatccctc ggctgcgacg cgcacttgtc 120
gcgccttgca ccacgaccat ccgaggggcta gccagtgagg ttgttcttga acccggttcc 180
gacccgatcc cgcgccgttc cgcggtgaat ttggactcag tcgaaagtgt ctcggtcgcg 240
gtattggtga atcggcttgg ccgcctcgcc gacatccgga tgcgcgccat ctgcacggcc 300
ctcgaggtcg ccgtcgattg ctctcgatga 330

<210> 74

<211> 118

<212> PRT

<213> Mycobacterium tuberculosis

<400> 74

Met	Met	Arg	Arg	Gly	Glu	Ile	Trp	Gln	Val	Asp	Leu	Asp	Pro	Ala	Arg
1				5					10					15	
Gly	Ser	Glu	Ala	Asn	Asn	Gln	Arg	Pro	Ala	Val	Val	Val	Ser	Asn	Asp
			20					25					30		
Arg	Ala	Asn	Ala	Thr	Ala	Thr	Arg	Leu	Gly	Arg	Gly	Val	Ile	Thr	Val
		35					40					45			
Val	Pro	Val	Thr	Ser	Asn	Ile	Ala	Lys	Val	Tyr	Pro	Phe	Gln	Val	Leu
	50					55				60					
Leu	Ser	Ala	Thr	Thr	Thr	Gly	Leu	Gln	Val	Asp	Cys	Lys	Ala	Gln	Ala
65					70				75					80	
Glu	Gln	Ile	Arg	Ser	Ile	Ala	Thr	Glu	Arg	Leu	Leu	Arg	Pro	Ile	Gly
			85					90					95		
Arg	Val	Ser	Ala	Ala	Glu	Leu	Ala	Gln	Leu	Asp	Glu	Ala	Leu	Lys	Leu
			100				105						110		
His	Leu	Asp	Leu	Trp	Ser										
	115														

<210> 75

<211> 93

<212> PRT

<213> Mycobacterium tuberculosis

<400> 75

Met	Leu	Arg	Gly	Glu	Ile	Trp	Gln	Val	Asp	Leu	Asp	Pro	Ala	Arg	Gly
1				5					10					15	
Ser	Ala	Ala	Asn	Met	Arg	Arg	Pro	Ala	Val	Ile	Val	Ser	Asn	Asp	Arg
			20				25						30		

Ala Asn Ala Ala Ala Ile Arg Leu Asp Arg Gly Val Val Pro Val Val
 35 40 45
 Pro Val Thr Ser Asn Thr Glu Lys Val Pro Ile Pro Gly Val Val Ala
 50 55 60
 Gly Ser Glu Arg Trp Pro Gly Arg Arg Phe Glu Gly Ala Gly Pro Ala
 65 70 75 80
 Gly Trp Ile Arg Arg Cys Ala Thr Ser Pro Leu Pro Ser
 85 90

<210> 76

<211> 114

<212> PRT

<213> Mycobacterium tuberculosis

<400> 76

Met Val Ile Ser Arg Ala Glu Ile Tyr Trp Ala Asp Leu Gly Pro Pro
 1 5 10 15
 Ser Gly Ser Gln Pro Ala Lys Arg Arg Pro Val Leu Val Ile Gln Ser
 20 25 30
 Asp Pro Tyr Asn Ala Ser Arg Leu Ala Thr Val Ile Ala Val Ile
 35 40 45
 Thr Ser Asn Thr Ala Leu Ala Ala Met Pro Gly Asn Val Phe Leu Pro
 50 55 60
 Ala Thr Thr Thr Arg Leu Pro Arg Asp Ser Val Val Asn Val Thr Ala
 65 70 75 80
 Ile Val Thr Leu Asn Lys Thr Asp Leu Thr Asp Arg Val Gly Glu Val
 85 90 95
 Pro Ala Ser Leu Met His Glu Val Asp Arg Gly Leu Arg Arg Val Leu
 100 105 110
 Asp Leu

<210> 77

<211> 102

<212> PRT

<213> Mycobacterium tuberculosis

<400> 77

Met Arg Arg Gly Glu Leu Trp Phe Ala Ala Thr Pro Gly Gly Asp Arg
 1 5 10 15
 Pro Val Leu Val Leu Thr Arg Asp Pro Val Ala Asp Arg Ile Gly Ala
 20 25 30
 Val Val Val Val Ala Leu Thr Arg Thr Arg Arg Gly Leu Val Ser Glu
 35 40 45
 Leu Glu Leu Thr Ala Val Glu Asn Arg Val Pro Ser Asp Cys Val Val
 50 55 60
 Asn Phe Asp Asn Ile His Thr Leu Pro Arg Thr Ala Phe Arg Arg Arg
 65 70 75 80
 Ile Thr Arg Leu Ser Pro Ala Arg Leu His Glu Ala Cys Gln Thr Leu
 85 90 95
 Arg Ala Ser Thr Gly Cys
 100

<210> 78

<211> 109

<212> PRT

<213> Mycobacterium tuberculosis

<400> 78

Met Thr Ala Leu Pro Ala Arg Gly Glu Val Trp Trp Cys Glu Met Ala
 1 5 10 15

Glu Ile Gly Arg Arg Pro Val Val Val Leu Ser Arg Asp Ala Ala Ile
 20 25 30
 Pro Arg Leu Arg Arg Ala Leu Val Ala Pro Cys Thr Thr Ile Arg
 35 40 45
 Gly Leu Ala Ser Glu Val Val Leu Glu Pro Gly Ser Asp Pro Ile Pro
 50 55 60
 Arg Arg Ser Ala Val Asn Leu Asp Ser Val Glu Ser Val Ser Val Ala
 65 70 75 80
 Val Leu Val Asn Arg Leu Gly Arg Leu Ala Asp Ile Arg Met Arg Ala
 85 90 95
 Ile Cys Thr Ala Leu Glu Val Ala Val Asp Cys Ser Arg
 100 105

<210> 79
 <211> 351
 <212> DNA
 <213> *Bacillus anthracis*

<400> 79
 ttgattgttaa aacgcggcga cgtgtatatt gcagaccttt cccagttgt tggttctgag 60
 caaggagggtg ttcgtccggt tctgttcatt caaatgaca tcggaaatcg ttttagtcca 120
 acggtgattg tagcggctat tactgcacag attcaaaaag cgaaattacc cactcatgtg 180
 gaaattgatg cgaaaaagta cggttttgag agagattctg ttattttact tgagcagatt 240
 cgaacaatcg ataagcagcg cttaacggac aaaatcactc acttagatga agtgatgatg 300
 attcgtgtag atgaagcgct acaaattagt ttaggactaa tagattttta a 351

<210> 80
 <211> 116
 <212> PRT
 <213> *Bacillus anthracis*

<400> 80
 Met Ile Val Lys Arg Gly Asp Val Tyr Phe Ala Asp Leu Ser Pro Val
 1 5 10 15
 Val Gly Ser Glu Gln Gly Gly Val Arg Pro Val Leu Val Ile Gln Asn
 20 25 30
 Asp Ile Gly Asn Arg Phe Ser Pro Thr Val Ile Val Ala Ala Ile Thr
 35 40 45
 Ala Gln Ile Gln Lys Ala Lys Leu Pro Thr His Val Glu Ile Asp Ala
 50 55 60
 Lys Lys Tyr Gly Phe Glu Arg Asp Ser Val Ile Leu Leu Glu Gln Ile
 65 70 75 80
 Arg Thr Ile Asp Lys Gln Arg Leu Thr Asp Lys Ile Thr His Leu Asp
 85 90 95
 Glu Val Met Met Ile Arg Val Asp Glu Ala Leu Gln Ile Ser Leu Gly
 100 105 110
 Leu Ile Asp Phe
 115

<210> 81
 <211> 348
 <212> DNA
 <213> *Pseudomonas putida*

<400> 81
 gtgaaacggt tgaaattcgc caggggtgat attgttcgcg tcaacctgga cccaacagtc 60
 gggcgggaac agcagggctc cggccgacct gcaactggtac ttactccggc tgcgttcaat 120
 gcttcaggcc tggctgtaat catcccgatc actcaagggtg gggatttcgc gaggcacatgc 180
 ggtttcgtg tcacgctcag cgggtgcgggc acgcagactc aggggggtgat gctttgcaac 240
 cagggtcgca cagtcgacct tgaagcacga ttgccaagc gcatagagtc ggtgcctgaa 300
 gctgtcatcc tggatgcact ggcgcgtgtg caaaccttat tcgattaa 348

<210> 82
 <211> 345
 <212> DNA
 <213> Mycobacterium celatum

<400> 82
 tgaattgctc tgacggaacg cggcgacatc tacatcgttt cgcttgaccc gacgtcggga 60
 catgagcaga gcggcacgcg cccagtattg gtcgtgtccc cgggcgcggt taatcgccctg 120
 acgaaaacac cggtcgtgct acctataaca cgcggcggga actttgcccg aacggcaggg 180
 ttcgctgtct cgctgaccga tgcgggtact cgcaccgccg gcgtaatacg ctgcatcag 240
 cctcgctcga ttgatatccg cgcccgtaaa ggccgcaagg ttgaacgtgt gccgtctggg 300
 gttcttgacg aagcgttggc caagctcgcc acgatcttga cttga 345

<210> 83
 <211> 366
 <212> DNA
 <213> Shigella flexneri 2a str. 301

<400> 83
 atggtaaagg cacggacgcc acatcgtggt gagatctggt attttaaccc tgatccggtt 60
 gccgggcatg aacttcaggg gccacattat tgcattgtgg taacggacaa aaaactcaac 120
 aatgttttaa aagttgctat gtgctgcccg atttcaacag gggcaaatgc agcacgttcc 180
 acaggggtga cggtgaaagt cctcccccg gatacgcaaa ccggtaacct gcatggcggt 240
 gtactttgtc accagctaaa agccgtcgat cttattgccc gtggcgctaa atttcatacc 300
 gttgccgatg aaaaattgat tagtgaagtt atcagtaaac tggatgaatt aatcgaccca 360
 caataa 366

<210> 84
 <211> 351
 <212> DNA
 <213> E. coli

<400> 84
 atggtaaaga aaagtgaatt tgaacgggga gacattgtgc tggttggcct tgatccagca 60
 agcggccatg aacagcaagg tgctggtcga cctgcgcttg tgctctccgt tcaagccttt 120
 aatcaactgg gaatgacgct ggtggcccc attacgcagg gcggaaattt tgcccgttat 180
 gccggattta gcgttccttt acattgcgaa gaaggcgatg tgcacggcgt ggtgctggtg 240
 aatcaggtgc ggatgatgga tctacacgcc cggctggcaa agcgtattgg tctggctgcg 300
 gatgaggtgg tggaaagagg gttattacgc ttgcaggcgg tggatgaata a 351

<210> 85
 <211> 115
 <212> PRT
 <213> Pseudomonas putida

<400> 85
 Met Lys Arg Leu Lys Phe Ala Arg Gly Asp Ile Val Arg Val Asn Leu
 1 5 10 15
 Asp Pro Thr Val Gly Arg Glu Gln Gln Gly Ser Gly Arg Pro Ala Leu
 20 25 30
 Val Leu Thr Pro Ala Ala Phe Asn Ala Ser Gly Leu Ala Val Ile Ile
 35 40 45
 Pro Ile Thr Gln Gly Gly Asp Phe Ala Arg His Ala Gly Phe Ala Val
 50 55 60
 Thr Leu Ser Gly Ala Gly Thr Gln Thr Gln Gly Val Met Leu Cys Asn
 65 70 75 80
 Gln Val Arg Thr Val Asp Leu Glu Ala Arg Phe Ala Lys Arg Ile Glu
 85 90 95
 Ser Val Pro Glu Ala Val Ile Leu Asp Ala Leu Ala Arg Val Gln Thr
 100 105 110
 Leu Phe Asp
 115

<210> 86
 <211> 111
 <212> PRT
 <213> Mycobacterium celatum

<400> 86
 Met Thr Glu Arg Gly Asp Ile Tyr Ile Val Ser Leu Asp Pro Thr Ser
 1 5 10 15
 Gly His Glu Gln Ser Gly Thr Arg Pro Val Leu Val Val Ser Pro Gly
 20 25 30
 Ala Phe Asn Arg Leu Thr Lys Thr Pro Val Val Leu Pro Ile Thr Arg
 35 40 45
 Gly Gly Asn Phe Ala Arg Thr Ala Gly Phe Ala Val Ser Leu Thr Asp
 50 55 60
 Ala Gly Thr Arg Thr Ala Gly Val Ile Arg Cys Asp Gln Pro Arg Ser
 65 70 75 80
 Ile Asp Ile Arg Ala Arg Lys Gly Arg Lys Val Glu Arg Val Pro Ser
 85 90 95
 Gly Val Leu Asp Glu Ala Leu Ala Lys Leu Ala Thr Ile Leu Thr
 100 105 110

<210> 87
 <211> 121
 <212> PRT
 <213> Shigella flexneri 2a str. 301

<400> 87
 Met Val Lys Ala Arg Thr Pro His Arg Gly Glu Ile Trp Tyr Phe Asn
 1 5 10 15
 Pro Asp Pro Val Ala Gly His Glu Leu Gln Gly Pro His Tyr Cys Ile
 20 25 30
 Val Val Thr Asp Lys Lys Leu Asn Asn Val Leu Lys Val Ala Met Cys
 35 40 45
 Cys Pro Ile Ser Thr Gly Ala Asn Ala Ala Arg Ser Thr Gly Val Thr
 50 55 60
 Val Asn Val Leu Pro Arg Asp Thr Gln Thr Gly Asn Leu His Gly Val
 65 70 75 80
 Val Leu Cys His Gln Leu Lys Ala Val Asp Leu Ile Ala Arg Gly Ala
 85 90 95
 Lys Phe His Thr Val Ala Asp Glu Lys Leu Ile Ser Glu Val Ile Ser
 100 105 110
 Lys Leu Val Asn Leu Ile Asp Pro Gln
 115 120

<210> 88
 <211> 116
 <212> PRT
 <213> E. coli

<400> 88
 Met Val Lys Lys Ser Glu Phe Glu Arg Gly Asp Ile Val Leu Val Gly
 1 5 10 15
 Phe Asp Pro Ala Ser Gly His Glu Gln Gln Gly Ala Gly Arg Pro Ala
 20 25 30
 Leu Val Leu Ser Val Gln Ala Phe Asn Gln Leu Gly Met Thr Leu Val
 35 40 45

Ala	Pro	Ile	Thr	Gln	Gly	Gly	Asn	Phe	Ala	Arg	Tyr	Ala	Gly	Phe	Ser
50					55					60					
Val	Pro	Leu	His	Cys	Glu	Glu	Gly	Asp	Val	His	Gly	Val	Val	Leu	Val
65				70					75					80	
Asn	Gln	Val	Arg	Met	Met	Asp	Leu	His	Ala	Arg	Leu	Ala	Lys	Arg	Ile
				85					90					95	
Gly	Leu	Ala	Ala	Asp	Glu	Val	Val	Glu	Glu	Ala	Leu	Leu	Arg	Leu	Gln
			100					105					110		
Ala	Val	Val	Glu												
		115													

<210> 89

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic oligonucleotide

<400> 89

aatgatgaca ctggaag

17

<210> 90

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic oligonucleotide

<400> 90

gtcgttgaca ttgatgg

17

<210> 91

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic oligonucleotide

<400> 91

atctcgaaca cgcagcc

17

<210> 92

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic oligonucleotide

<400> 92

tcgttttaca cccttga

17